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A NEW GENUS AND SPECIES OF SCORPION FROM SOUTH AUSTRALIA (BUTHIDAE: BUTHINAE).

by N.A. LOCKET*

Summary

LOCKET, N.A. (1990) A new genus and species of scorpion from South Australia (Buthidae: Buthinae). *Trans. R. Soc. S. Aust.*, 114(2), 67–80, 31 May, 1990.

Australobuthus xerolimniorum gen. et sp. nov. is described and illustrated. The scorpion, recorded from dry salt lakes in South Australia, is uniformly pale fawn except for eye pigment, lacks keels on the carapace, and has long pectines with 30-36 teeth. Metasomal segments are squat and keeled. The vesicle is small and lacks a definite subaculear tooth. The taxon is compared with *Isometroides vescus* and *Lychas alexandrinus*, which it resembles but from which it differs in features of the metasoma, pectine length, trichobothrial pattern, hemispermatophores and colour.

KEY WORDS. *Australobuthus xerolimniorum* gen. et. sp. nov., new species, scorpion, Australia, taxonomy.

Introduction

The early work on Australian scorpions, and notably that of Keyserling (1885), was consolidated by Kraepelin (1899). This work was reviewed by Glauert (1925), the paper serving as a basis for the Buthidae for the monograph of Koch (1977) on all Australo-Papuan scorpions. Koch reduced to three the ten species of *Lychas*, and synonymised the two *Isometroides* described by Glauert (1925).

Examination of buthid scorpions in the collection of the South Australian Museum and the author's collection has revealed some specimens which do not fit the published descriptions. Living examples of this new taxon have since been obtained, allowing the following description to be supplemented by information on habitat and behaviour.

Materials and Methods

The holotype, allotype and ten paratypes are in the collection of the South Australian Museum, Adelaide (SAM). Referred material includes eight specimens in the South Australian Museum and nine in the author's collection. Terminology follows Hjelle (in press); that for trichobothria follows Vachon (1973). Measurements were made with an eyepiece micrometer, and are expressed as mean ± standard deviation. Figures were drawn using a camera lucida, with details added freehand, except for Fig. 3. In this composite figure the posture was drawn from a negative of a photographed living specimen, projected onto a baseboard, and detail added freehand from preserved specimens. Measurements of width of lamina and length of tooth of pectines were made as in Fig. 7c. The right hemispermatophores were drawn, following Koch (1977), except that each was drawn from two positions, with the lamina perpendicular to the page, and rotated 90° to the right. Live specimens have been observed by U.V. light in the field (Stahnke 1972), and later kept for several months in the laboratory in containers of slightly damp sand containing a flat stone as shelter; the animals were fed mealworms at intervals.

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Systematics

Family: Buthidae Simon, 1879
Subfamily: Buthinae Kraepelin, 1899

Australobuthus gen. et sp. nov.
Type species: *Australobuthus xerolimniorum* sp. nov.

Diagnostic definition: Carapace without definite keels. Median eyes in anterior half of carapace. Three subequal lateral eyes. Tergites I-VI with poorly developed median keel, no lateral keels. Pretergites of I-VI with distinctly wavy posterior margin. Pectines long, reaching to or beyond trochantero-femoral joint of fourth leg, 30-36 teeth. Metasomal segments stout, squat, of almost equal width, all keeled. Vesicle small, somewhat elongate, not keeled. Aculeus stout, clearly distinct from vesicle, definite subaculear tooth absent, but rudimentary subaculear tubercle in some specimens (mostly juveniles). Chelicerae with single ventral tooth on fixed finger. Pedipalp: Femoral trichobothria, four dorsal and five internal. β pattern, d4 close to anterosuperior keel, d1, d3 and d4 forming a right angle. Patella with 13 trichobothria. Hand small, rounded, keels absent. Fixed fingers with six, movable with seven slightly imbricated rows of fine

even denticles, extending full length of fingers, flanked by internal and external accessory teeth. One or two accessory teeth proximal to terminal tooth and medial to distal row of denticles. Twelve trichobothria.

Etymology: The generic name, *Australobuthus*, refers to the southerly distribution of this buthid scorpion.

Comparison with other genera

The new genus shares a number of characters with *Isometroides* and *Lychas*, but differs from both in significant features. The metasomal segments are all keeled like those of *Lychas*, though the arrangement of the keels is different. The fifth metasomal segment of *Isometroides* is not keeled, but smooth and markedly punctate. The presence of a definite subaculear tooth, lacking in the new genus, is a diagnostic character of *Lychas*. *Isometroides* lacks a subaculear tooth; the vesicle and aculeus in that genus merge without clear distinction and are more elongated than in the new genus. The vesicle of *Australobuthus* is markedly smaller than in *Lychas*. The pectines are substantially longer, and with more teeth, than in either *Lychas* or *Isometroides*. These differences justify the erection of a new genus.

Australobuthus xerolimniorum sp. nov.
FIGS 1–14

Holotype: SAM NI988568. Adult male. Under log, Lake Hart shore, S. Aust. xii. 1984. B. Guerin.
Allotype: SAM NI988569 Adult female. On surface, Lake Gilles, S. Aust. 32° 41′ S, 136° 54′ E. 12.x.1980. P. Hudson.

Paratypes: (All paratypes are adult. Several juveniles are included in the referred material.) SAM NI988 570–72. Under stones on salt, Price Peninsula, Lake Eyre, 7.xi.1955. E.T. Giles 2♀♀, 1♂; SAM NI988 573 Everard Ranges. x-xi. 1970. G.F. Gross, E.G. Matthews. ♀; SAM NI988 574 In lycosid burrow, Lake Gilles, (32° 43′ 06″ S, 136° 48′ 14″ E), 26.xii.1980. P. Hudson ♂; SAM NI988 575. Lycosid burrow, Lake Gilles. 1.iii.1980. P. Hudson ♂; SAM NI988 576. Lake Gairdner, surface. viii.1987. P. Hudson ♀; SAM 1988 577–579. Lake Gairdner, surface. 5.i.1989. P. Hudson ♀♀.

Diagnosis: As for the genus with the following additions. Small (35–42 mm total length, adult). Pale fawn, due to lack of subcuticular pigment except around eyes. Carapace and tergites I-VI finely granular or shagreened. Median eyes large, diameter $\bar{x}$ 0.81, (±0.18, n= 21), $\bar{x}$ interocular distance. Pectine tooth count 30–36, $\bar{x}$ = 33, ± 1.8 (n=4), pectinal teeth uniform.

Description: Measurements of holotype and allotype in Table 1.

Length. 40.5 mm. Colour. Metasoma and extremities very pale fawn, transilluminate freely (Fig.1). Black pigment in and around median and lateral eyes, otherwise no subcuticular pigmentation (Fig. 2). Dorsal surface of mesosoma appears striped, due to pale borders of tergites showing up against dark coloured viscera. Extremities show little dark sclerotisation, but cheliceral teeth and teeth along the fingers dark. Aculeus and pedal claws, but not tibial nor pedal spurs, darkly sclerotised.

Carapace (Figs. 3, 4). Almost straight finely granular anterior border bearing a few small setae, frontal notch hardly distinguishable, anterolateral angles rounded. Posterior margin almost straight, without setae. Surface finely granular or shagreened, granularity most prominent in anterior half. Definite keels absent, interocular area smooth. Median groove continues over ocular tubercle, which rises about half one median eye diameter above carapace line. Supraciliary ridges finely granular, but not continued as keels. Median eyes large, 0.12 × carapace length, diameter 0.84× interocular distance. Posterior border of eye in front of midpoint of carapace. Three lateral eyes subequal, corneas contiguous, half their own diameter from carapace margin. Pigment deep to eyes continuous.

Tergites of first six mesosomal segments almost smooth or finely shagreened, posterior edges smooth, with fine granules. Poorly developed smooth median keel but no lateral keels. Smooth pretergite bounded posteriorly by distinctly wavy margin (Fig. 5).

Seventh mesosomal tergite shagreened, with low central ridge only in anterior two thirds of segment, but two well-developed lateral pairs of finely denticulate keels present in posterior two thirds. Posterior border smooth, with fine granules, dorsal and ventral lateral borders rounded, with fine denticulation.

Sternites (Fig. 6). Smooth, shiny, with fine setae along posterior border. Spiracles small, slightly concave posteriorly. Seventh mesosomal sternite smooth, shiny, with rounded posterior border. Lateral keels finely granular, prominent in posterior two thirds of segment, median keels less developed, in posterior half.

Sternum (Fig. 4b). Subtriangular, small median eminence anteriorly with pit with densely sclerotised but pale walls directly posterior to it, and deep pit in posterior part of sternum. Genital operculum divided in all specimens.

Fig. 1. Above, *Australobuthus xerolimniorum* gen. et sp. nov., adult male, Lake Gairdner; below, adult female, Lake Gairdner. Scale bar = 5mm.

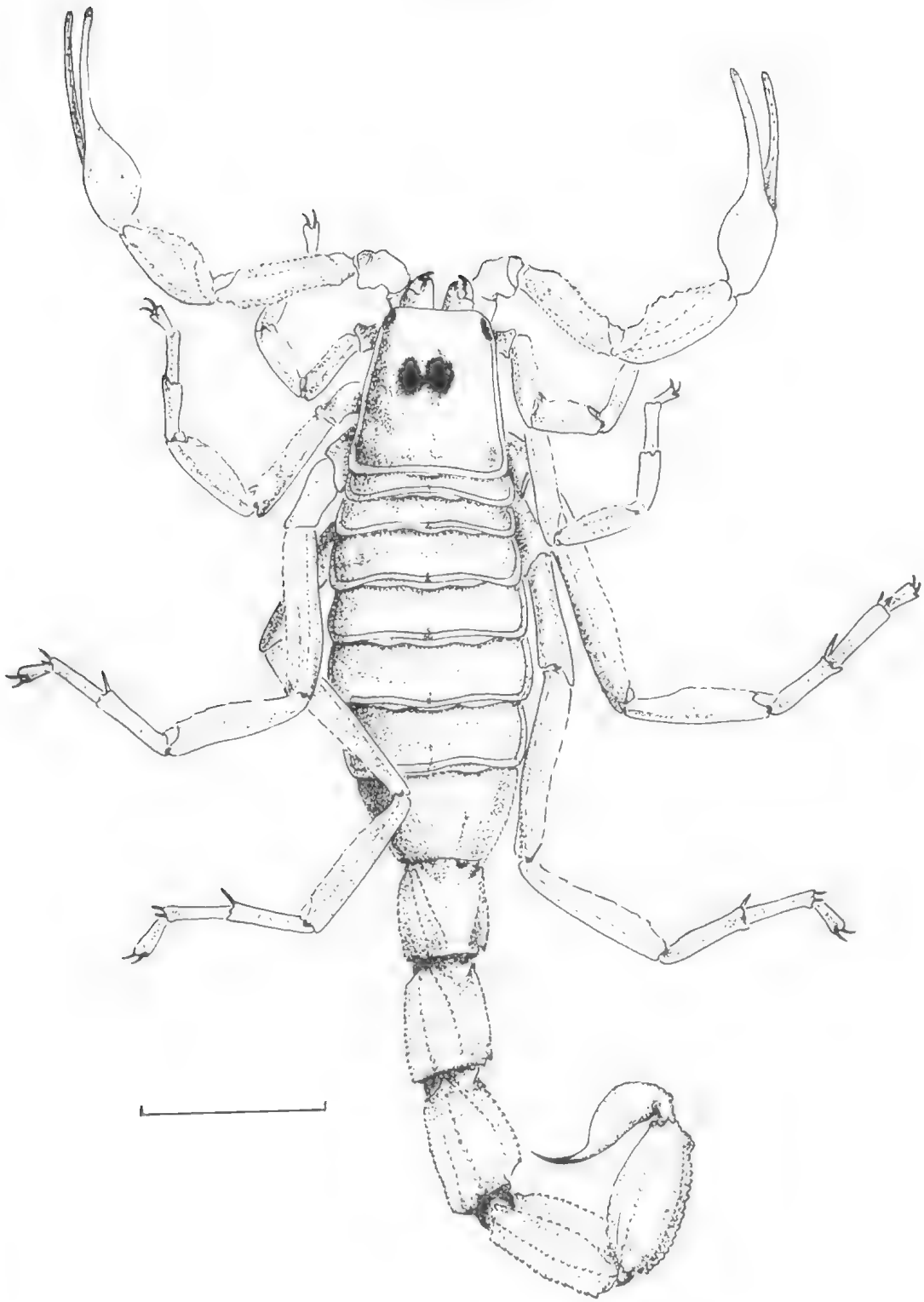


Fig. 2. *Australobuthus xerolimniorum* gen. et sp. nov., male. Scale bar = 5mm.

Pectines (Fig. 7). Very long, 32, 33 teeth, extending well beyond trochantero-femoral joint of fourth leg and close to rear border of sternite III, covering the spiracle of that sternite.

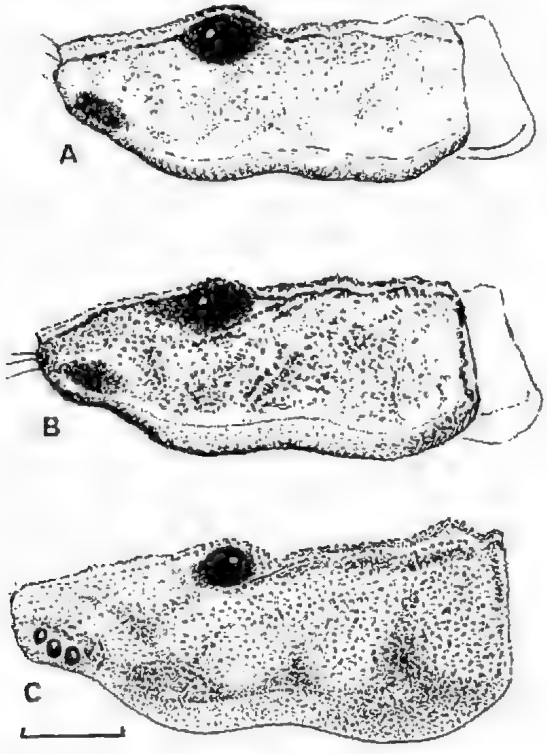


Fig. 3. Carapace, lateral view. A, *Australobuthus xerolimniorum* sp. nov. B, *Lychas alexandrinus*. C, *Isometroides vescus*. Scale bar = 1mm.

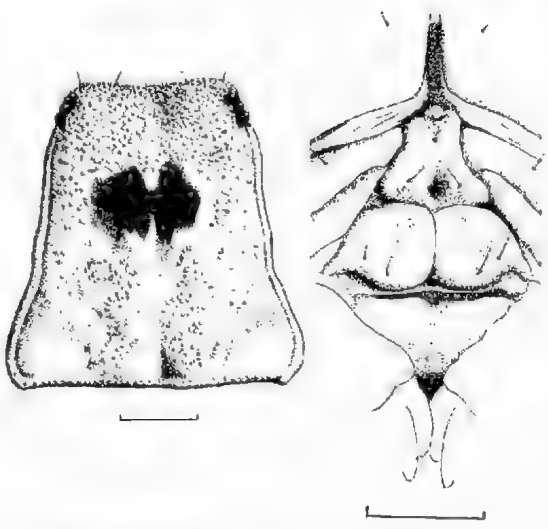
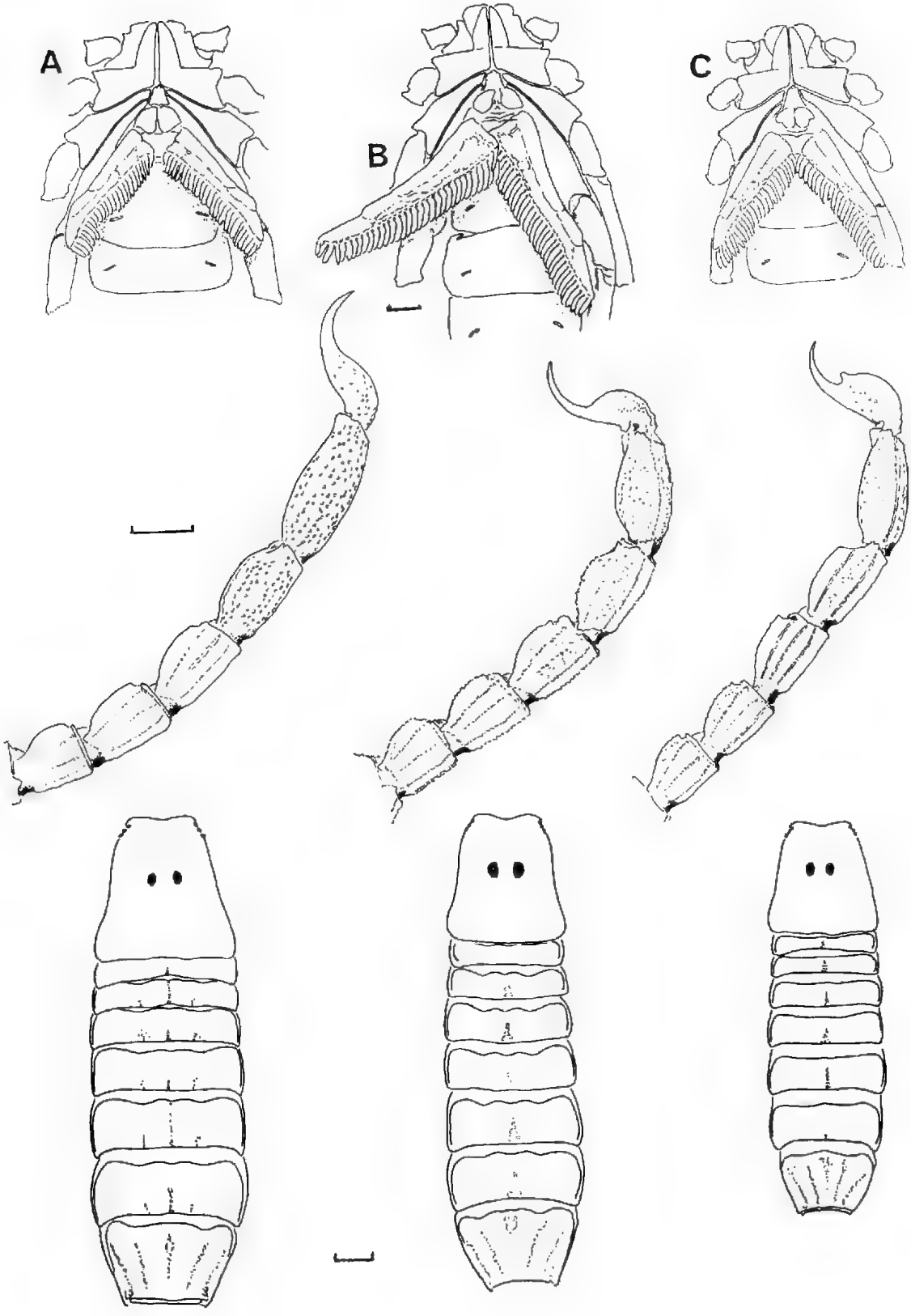


Fig. 4. *Australobuthus xerolimniorum* gen. et sp. nov. A, Carapace. B, Sternum and genital operculum. Scale bars = 1mm.

Metasoma (Fig. 8a). Length of metasoma, 0.55 × total length. First and fifth segments equally wide, slightly wider than second, third and fourth, which are themselves of equal width. Dorsal surfaces of metasomal segments smooth, lateral surfaces mostly smooth, not shiny, with few fine granules. First four segments squat, intercarinal surfaces smooth, not shiny. First segment with ten granular keels, terminal tooth of these hardly enlarged. Ventromedial keels entire, equidistant from each other as from ventrolateral. Lateral keel

TABLE 1. *Measurements in mm, of* Australobuthus xerolimniorum, *gen. et sp. nov. Holotype male, allotype female.*

	♂	♀	♂	♀	♂	♀
Total length	40.5	39.5				
Carapace	L 4.6	4.3	W 4.5	4.3		
Mesosoma	L 12.0	13.6				
Metasoma I	L 3.0	2.6	W 2.6	2.6	H 2.3	2.2
II	L 3.3	3.0	W 2.6	2.4	H 2.3	2.2
III	L 3.4	3.0	W 2.6	2.4	H 2.3	2.2
IV	L 4.1	3.5	W 2.5	2.5	H 2.2	2.1
V	L 4.3	3.9	W 2.6	2.6	H 2.1	1.8
Telson	L 4.2	4.1				
Vesicle	L 2.4	2.2	W 1.4	1.4	H 1.3	1.1
Aculeus	L 1.9	1.9				
Pedipalp; femur	L 3.5	3.2	W 1.0	1.0	H 0.7	0.7
Patella	L 3.8	3.4	W 1.4	1.4	H 1.1	1.1
Hand	L 6.0	5.6	W 1.3	1.1	H 1.4	1.2
Movable finger	L 4.1	3.8				
Fixed finger	L 3.7	3.4				
Chelicera:						
Movable finger	L 1.0	1.1				
Fixed finger	L 0.5	0.6				
Pectine	L 6.8	5.8				
Teeth (max.)	L 1.0	0.9				
Pectine tooth count	34,35	31,32				


A
B
C

present on posterior 2/3 of segment. Second and third segments similar. Fourth segment with eight keels, lacking lateral keel. Fifth segment stout, with four definite keels and coarsely granular, poorly defined, complete, not bifurcating ventromedian keel. Ventrolateral keel denticulate, dorsolateral granular, less prominent. Few intercarinal granules. Median dorsal furrow smooth, somewhat shiny.

Telson. Vesicle small, rather elongate. (Width of vesicle/width of metasomal segment V; 0.55). Smooth and shiny with few scattered small granules, no keels. No subaculear spur but minimal subaculear tubercle in small specimens. Aculeus stout, sharply curved, terminal half dark due to sclerotisation.

Chelicerae (Fig. 9). Manus and fingers smooth, pale; teeth dark (due to sclerotisation, not subjacent pigment), without secondary serrations, single ventral tooth on fixed finger, pattern as shown in figure.

Pedipalp (Fig. 10). Femur; dorsal and posterior surfaces finely granular, not shiny. Anterior surface smooth with scattered fine granules and irregular line of large granules and denticles, some bearing strong setae. Anteroventral keel of small regular granules, anterodorsal keel of small regular granules without setae. Posterodorsal and posteroventral keels of small, less regular granules, some bearing setae, particularly at the ends.

Patella; smoothly curved posterior border, smooth or finely shagreened surfaces, not shiny. Keels on dorsal surface weakly granular. Anterior border coarsely denticulate and granular, some teeth and granules bearing setae. Ventral surface smooth, convex.

Hand; small, rounded, no keels, smooth and shiny, bearing scattered setae. Fingers long, slender, 0.64 × length of whole hand. Straight in lateral view, gently curved in dorsal view. Movable finger with eight external accessory teeth, seven internal and one terminal. Seven oblique rows of fine even teeth. Fixed finger with six-seven external accessory teeth, six internal and one terminal. Six oblique rows of fine teeth. Fixed finger with scattered fine setae, movable finger with more, particularly ventrally and at tip. Trichobothrial pattern as shown in Fig. 11.

Legs (Fig. 12). Smooth or finely shagreened on dorsal surfaces, shiny ventrally, keels low and rounded, barely granular. Single pale tibial spur on third and fourth legs, two equal pale spurs on tarsomere II of all legs. Terminal claws equal on all legs. Few stout setae on femora, stout setae on

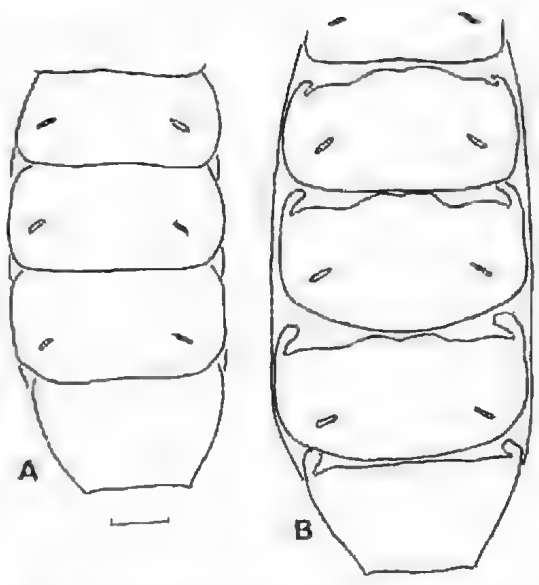


Fig. 6. *Australobuthus xerolimniorum* gen. et sp. nov. Outlines of sternites showing sexual dimorphism. A, male. B, female. Scale bar = 1mm.

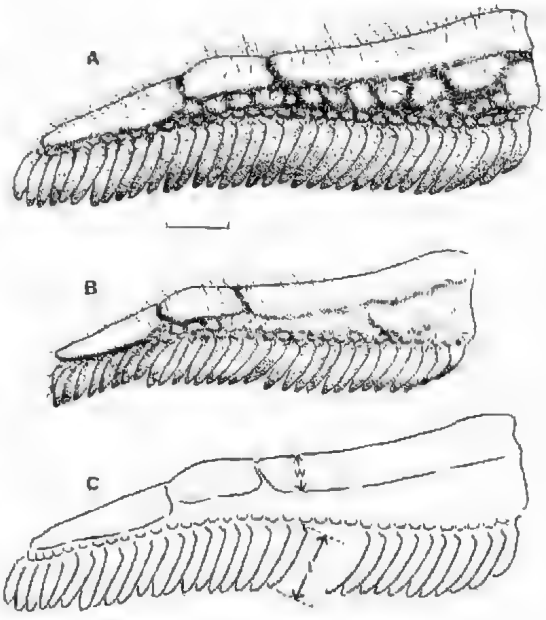
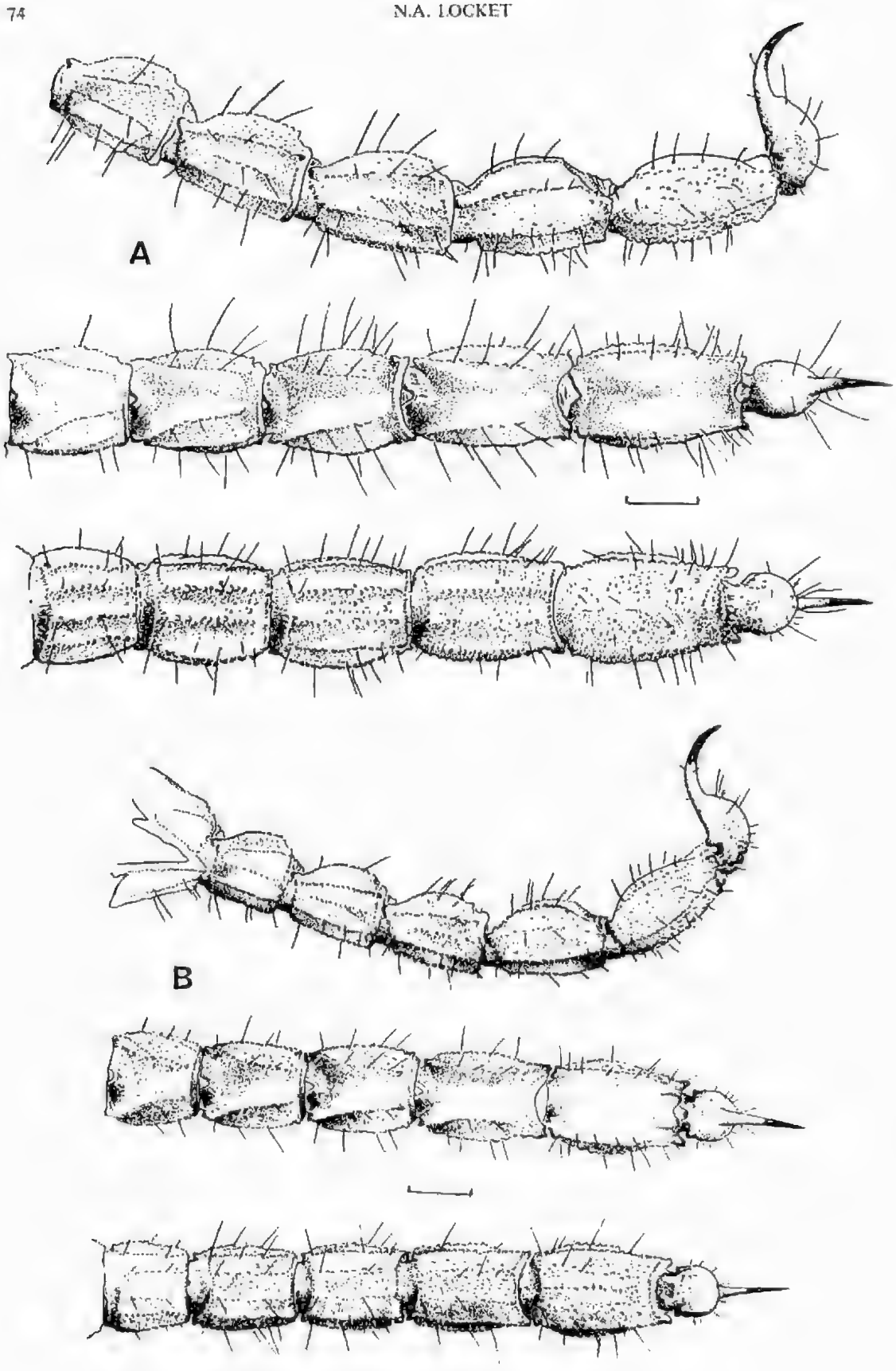


Fig. 7. *Australobuthus xerolimniorum* gen. et sp. nov. Pectines. A male, B, female. C. Measurement site for width of lamina, W, and length of tooth, L. Scale bar = 1mm.

Fig. 5. Ventral views to show proportions of pectines, lateral views of metasoma and dorsal view of carapace and tergites. A, *Isometroides vescus*, B, *Australobuthus xerolimniorum*, C, *Lychas alexandrinus*. Scale bar, common to each series = 1mm.


A
B

anterior and posterior borders of patella, especially along anterior. Setae evenly distributed on tibia, and tarsomeres I and II. Those on tarsomere I mostly in two rows, on tarsomere II scattered irregularly and closely packed, not forming a comb.

Variation

No specimens show any trace of pattern; all are pale except for the eye pigmentation. The median eyes appear large in all, their diameter =0.09–0.14 × carapace length (n=21, $\bar{x}$ = 0.125, ± 0.015). Their diameter is 0.59–1.08 × interocular distance, (n=21, $\bar{x}$ = 0.81, ±0.18). All but one have three lateral eyes on each side; one specimen has four on one side and three on the other. The posterior borders of the sternites are markedly convex in juveniles (and in adult females, see sexual dimorphism, below). The pectines are long in all, with tooth count 30–36 (n=41, $\bar{x}$ =0.56 m ± 0.04). None have a definite subacular tooth, but a minimal subaculear tubercle is present in some specimens, mainly juveniles. The fingers are long in all, 0.63–0.68 × hand length (n=20, $\bar{x}$ = 0.65, ± 0.02).

Etymology: The specific name, *xerolimniorum*, is from Greek xeros, dry and limne, lake.

Sexual dimorphism: In some scorpions the sexes may be distinguished easily by differences in bodily proportions, females tending to have larger and stouter mesosomas with respect to the metasoma than males. Pectine tooth counts also may vary between sexes, males tending to have more teeth than females. Neither criterion applies in the present case. Some specimens appear to have stout mesosomas, but this is due to distension. Comparisons of the widths of tergite III with metasomal segment V show no significant difference; nor is there a significant difference in pectine tooth counts.

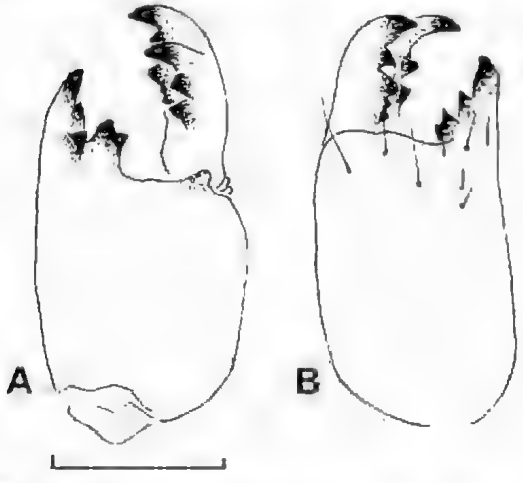


Fig. 9. *Australobuthus xerolimniorum* gen. et sp. nov. Chelicera showing dentition, dense ventral patch of setae omitted. A, ventral, B, dorsal. Scale bar = 1mm.

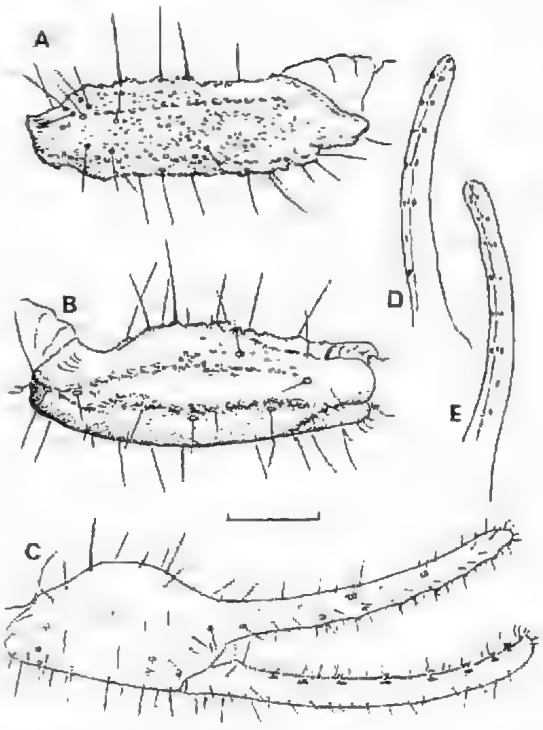


Fig. 10. *Australobuthus xerolimniorum* gen. et sp. nov. Pedipalp. A, femur, dorsal. B, patella, dorsal. C, hand, lateral. D, dentition, fixed finger. E, dentition, movable finger. Scale bar = 1mm.

The presence of hemispermatophores or embryos within the body would be clear evidence of sex, but entail dissection of the specimen and are not applicable to immature examples. Only one male of four opened contained hemispermatophores, (Fig. 13). Males have genital papillae beneath the plates of the genital operculum, but these are not visible in life. Other characters have therefore been sought which will enable the sexes to be told apart in the intact or living animal.

Though the pectine tooth counts are very similar in the two sexes, there are distinct differences in the lengths of the pectines relative to the trochantero-femoral joint of the fourth leg. In males the pectine extends well past this joint (Fig. 5), but in females it extends little if at all past the joint. There is also a difference in the proportion, width of

Fig. 8. *Australobuthus xerolimniorum* gen. et sp. nov. Lateral, dorsal and ventral views of metasoma. A, male, B, female. Scale bar = 1mm.

lamina/tooth length. (Fig. 7c). The mean of this ratio is 0.40, ±0.03 (n=9,) in males and 0.50, ±0.06 (n=6) in females.

Another character which appears to be useful is the shape of the posterior borders of sternites 3 and 4. In males these are straight or concave, but in females they are convex (Fig. 6). This character, however, is probably unreliable in juveniles; in those examined the border of all sternites are strongly convex.

Distribution

Specimens have been recorded from Lake Eyre, Lake Hart, Lake Gairdner and Lake Gilles in South Australia. One specimen is labelled Everard Ranges; the exact locality is not specified, but was probably close to Victory Well (G.F. Gross pers. comm.). All known localities are shown in Fig. 14.

Habitat and behaviour

All but one of the thirty specimens known to date have been found on the shores or surfaces of dry lakes in S. Aust. (B. Guerin, P. Hudson pers. comm.; pers. obs.) Some have been taken by day under logs on the salty lake surface, sometimes up to 100 m from the shore. Some of these have been in a shallow scrape under the log, but others have been dug from vertical or oblique cylindrical burrows up to 15 cm deep. Scorpions may be inhabiting a pre-existing burrow, but they are certainly capable of vigorous digging themselves, and have constructed similar burrows in captivity. Four specimens from Lake Hart were captured by the use of U.V. light at night. One of these was on the surface of the lake near a line of partly fallen fence posts, the others among sand and low vegetation on the shore. Those seen on the surface at night were walking slowly about, with the tail held over the back, but when they were allowed to move about on sand by day they ran with the tail extended behind, proving very agile.

Comparison with other species

Glauert (1925) described ten species of *Lychas* and two of *Isometroides*, but Koch (1977) reduced these

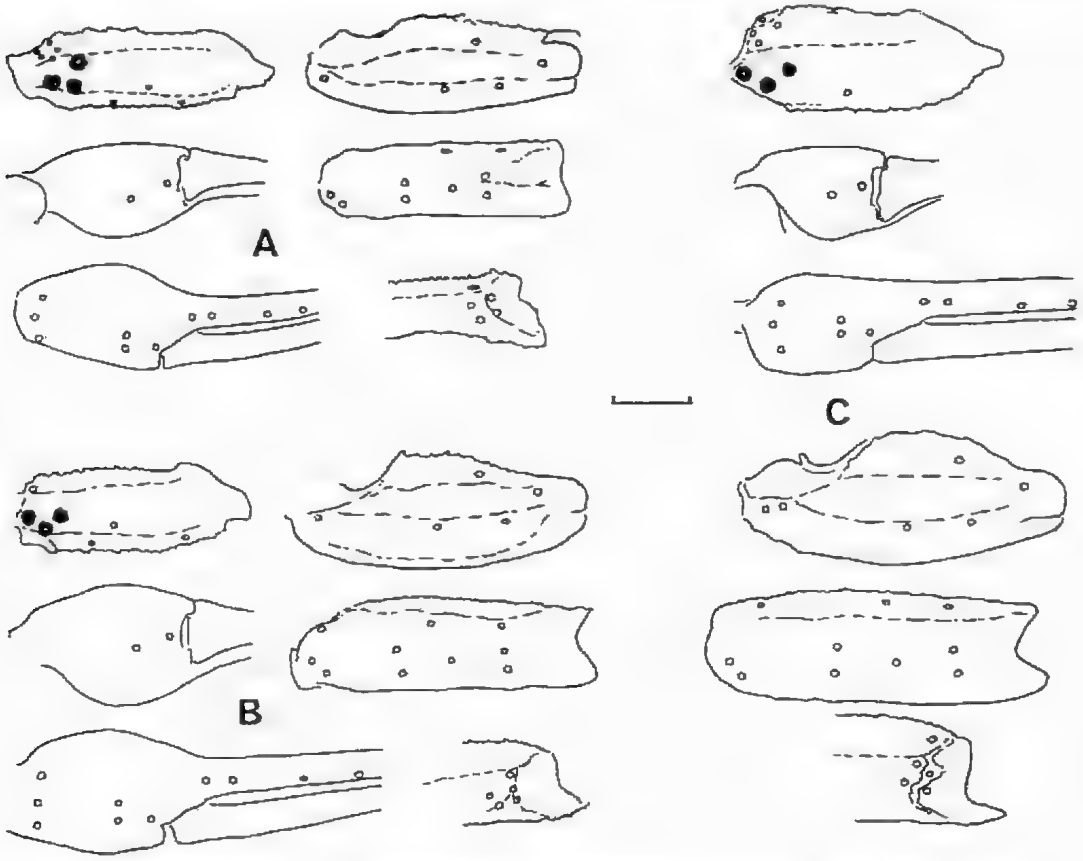


Fig. 11. Trichobothrial patterns. A, *Australobuthus xerolimnorum* sp. nov. B, *Lychas alexandrinus*. C, *Isometroides vescus*. Scale bar = 1mm.

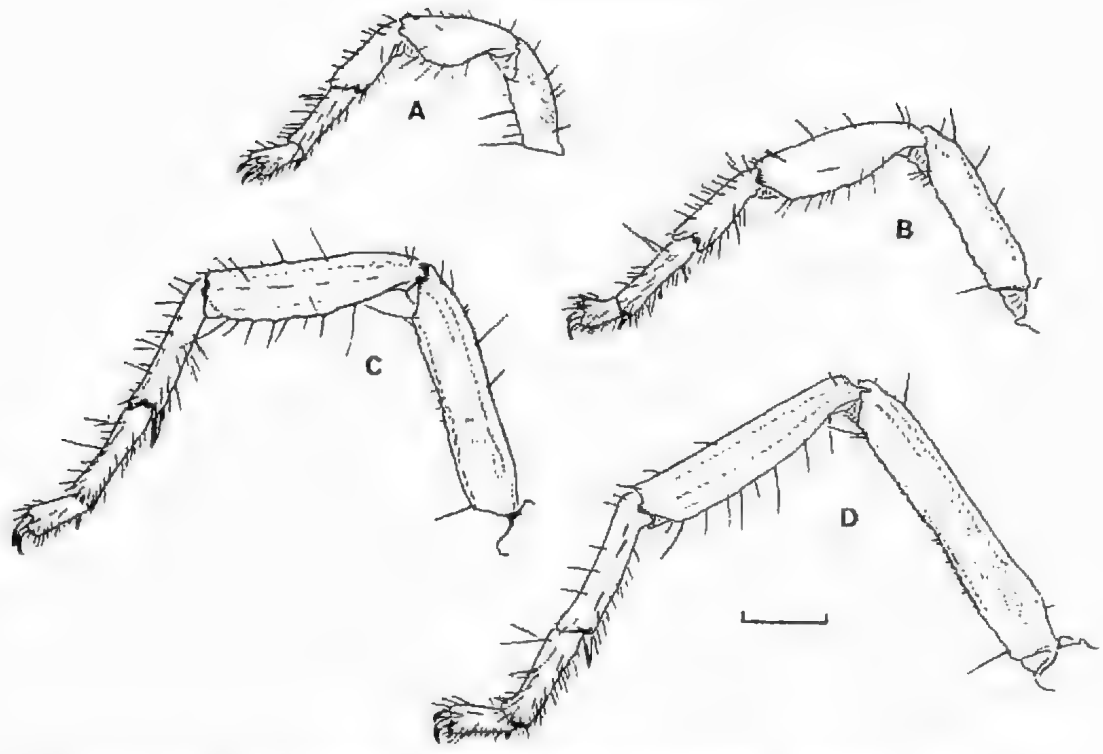


Fig. 12. *Australobuthus xerolimniorum* gen. et sp. nov. Walking legs. A–D = I–IV. Note tibial spurs on III and IV, tarsal spurs on all. Scale bar = 1mm.

to three *Lychas* and one *Isometroides*. Glauert's work is not illustrated, but it is clear from the descriptions given, particularly the pectine tooth counts and attention given to the subaculear tooth, that neither author had before him examples of the taxon now described.

The new taxon, *Lychas alexandrinus* and *Isometroides vescus* are sympatric at Lake Hart and possibly elsewhere, and the three are now compared.

Of comparable size to *L. alexandrinus*, but smaller than a mature *I. vescus*, live specimens of *A. xerolimniorum* sp. nov. are markedly paler than both of these species. *L. alexandrinus* is usually a reddish sandy colour, with some patterning on the mesosoma, and the proximal two thirds of the fifth metasomal segment is darkly pigmented. *I. vescus* varies in colour, some specimens being variegated like *L. alexandrinus*, and others showing a uniformly dark body but pale legs. In all, however, the fifth metasomal segment and the entire telson are black or nearly so. The metasomal segments and telson of *A. xerolimniorum* sp. nov. are unpigmented.

The carapace of *A. xerolimniorum* sp. nov. is less sculptured than that of the other two species. That of *I. vescus* and *L. alexandrinus* is markedly granular, though without keels, but the carapace of *A. xerolimniorum* sp. nov. is finely granular, particularly on the posterior half, or merely shagreened. The median eyes of *A. xerolimniorum* are usually larger than those of the other two (Fig. 3).

Though not previously used as a character in scorpion taxonomy, the shape of the border between the pre- and post-tergites shows a difference between the three species. This border is markedly more sinuous in *A. xerolimniorum* sp. nov. than in *L. alexandrinus*; that of *I. vescus* is intermediate in form (Fig. 5).

The pectines of *A. xerolimniorum* sp. nov. are much longer than those of either *I. vescus* or *L. alexandrinus*. In *A. xerolimniorum* sp. nov. they extend as far as, in females, or in males well beyond, the trochantero-femoral joint of the fourth leg, but in the other two they fall short of or barely reach that joint (Fig. 5). The tooth count reflects this greater length, being 30–36 in *A. xerolimniorum* sp. nov. compared with 17–29 in *L. alexandrinus* and 20–28 in *I. vescus* (Koch 1977; pers. obs.).

The form of the telson is different in the three, (Fig. 5) and, with the colour differences, enables them to be distinguished easily in the field. The vesicle of *A. xerolimniorum* sp. nov. is noticeably small, without a definite subaculear tooth. The

genus *Lychas* is characterised by a prominent subaculear tooth, and this is well shown by *L. alexandrinus*. *I. vescus* has a long telson in which the aculeus and vesicle appear continuous and there is no trace of a subaculear tooth or tubercle.

The fifth metasomal segment also differs between the three. That of *A. xerolimniorum* sp. nov. is squat, with well marked granular keels and scattered granules on the intercarinal surfaces. In *L. alexandrinus* the keels are less pronounced and the whole segment is markedly smoother than in *A. xerolimniorum* sp. nov., though it has some fine granulation, particularly on the ventral surface. *I. vescus* however shows no trace of granulation nor of keels. Rather there are numerous pits over the otherwise smooth and shiny surface. The fourth metasomal segment in *A. xerolimniorum* sp. nov. is considerably more granular than that of *L. alexandrinus* (Fig. 5) and the dorsal keel terminates in a prominent denticle.

The trichobothrial patterns of the three are shown in Fig. 11, and a small but constant difference is apparent. In *A. xerolimniorum* sp. nov. femoral trichobothria d^1, d^3 and d^4(filled circles in figure)

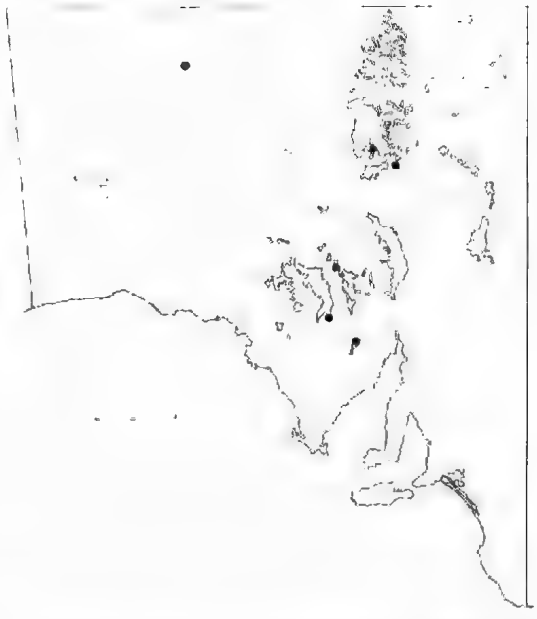


Fig. 14. Sites from which *Australobuthus xerolimniorum* gen. et sp. nov. has been collected. Scale bar = 100km.

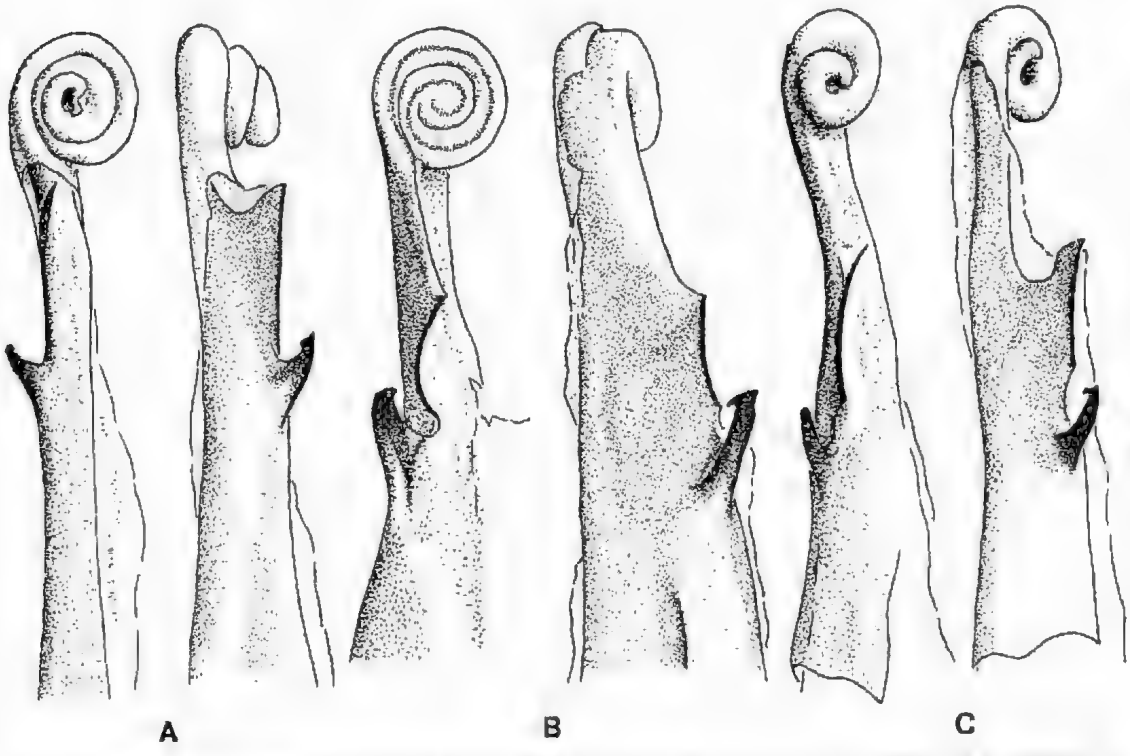


Fig. 13. Hemispermatophores. A, *Lychas alexandrinus*. B, *Isometroides vescus*. C, *Australobuthus xerolimniorum* sp. nov. Each pair shows the hemispermatophore with the lamina seen edge on, left, and rotated to the right by 90°, right.

form a right angle, whereas in the other two they form an obtuse angle open anteriorly.

Differences are also shown in the hemispermatophores (Fig. 13). These structures are strongly curved in three dimensions, and the appearance of the various features thus changes markedly with direction of view. The hemispermatophores of the three species are all of simple form with a curled flagellum, unlike that of *Isometrus melanodactylus* illustrated by Koch (1977) or the north African buthids illustrated by Vachon (1952). The degree of flagellar curling is simpler in the example of *Australobuthus* examined than in the other two. This may be a reliable character, but it is also possible that it reflects the state of maturity of the hemispermatophore. The proportions of the basal lobe and lamina do, however, distinguish the three distinctly.

Referred material: South Australian Museum: Sulphur Peninsula, Madigan Gulf, Lake Eyre North, 4.xi.1966, G.F. Gross. Malouinna Station, Sulphur Peninsula, Lake Eyre North, 2.ix.1971, S end of Lake Gairdner, 13.x.1986, P. Hudson. Lake Gairdner, 25.xi.1959, B. Mason. Lake Gairdner, vii.1987, P. Hudson. (2 specimens) Lake Gairdner, 5.i.1989, P. Hudson. (3 specimens). Author's Collection: Lake Hart shore, xi.1984, B. Guerin. (2 specimens). Lake Hart shore, 27.i.1987, N.A. Locket. Lake Hart shore, 25–26.i.1988, N.A. Locket. Lake Hart shore, 5.i.1989, N.A. Locket.

Key to Australian Genera of the Subfamily Buthinae. (See Also Figs 5, 11, 13)

1 Tibial spur absent on third and fourth legs. . . . . *Isometrus*
Tibial spur present on third and fourth legs. . . . 2
2 Vesicle with definite subaculear tooth or tubercle . . . . . *Lychas*
Vesicle without definite subaculear tooth or tubercle 3
3 5th metasomal segment smooth, pitted, without keels. Fourth and fifth metasomal segments and vesicle dark. Vesicle and aculeus merge comma-shaped. Pectines with 20–28 teeth . . . . . *Isometroides*
All metasomal segments keeled. Vesicle small but distinct. Pectines with 30–36 teeth . . . . . *Australobuthus* gen. nov.

Discussion

Almost all the known specimens have been taken on the shores or surfaces of dry lakes, where they find cover by burrowing or by living beneath detritus. The burrowing habit appears to be unusual for a buthid species. The burrows, which the scorpion readily digs for itself in captivity, are very different from the spiral burrows of the scorpionid genus *Urodacus* (Koch 1978; Shorthouse & Marples 1980). In some cases the burrows in which *A. xerolimniorum* sp. nov. has been found may have been taken over from spiders or other burrowing animals: P. Hudson (pers. comm.) has recorded at least one from a lycosid burrow. Among Australian buthids, *Isometroides*, a specialised predator of burrowing spiders, has frequently been found in spider burrows, identified as such by the spider or remains of it being found in the burrow, or the presence of a trapdoor or silk lining. (Main 1956; Koch 1977). The latter mentions *L. alexandrinus* being found in spider burrows on occasion, but *L. marmoreus* and *L. variatus* are usually found under stones or bark.

Dedication

I dedicate this work to my father, George Hazelwood Locket, in his ninetieth year, and seventy-eighth as an arachnologist.

Acknowledgments

I wish to thank Dr Bernard Guerin for his gift of specimens amongst which I first recognised the new scorpion, Mr and Mrs Ian Read for their hospitality and for permission to look for scorpions on their property, Mr Peter Hudson for access to live specimens from Lake Gairdner, Dr David Lee for access to specimens in the South Australian Museum, Deirdre Locket for assistance in the field, Dr Gary Polis and Dr David Sissom for valuable discussions on problems of scorpion taxonomy and biology and Dr Sissom for access to his key to buthid genera. Mr G.R. Johnston gave valuable comments on the manuscript and Professor Robert Ussher gave advice on deriving the specific name.

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